

Field Log and Photographs

By: **Peter Cambouris**

Subject: **Feddeler C/D Landfill North Facility** Sheet No: **1 of 3**

Date: **May 13, 1998**

East Cell Clay Liner Construction

Job No: **0072-03-10**



Photograph #1

Date: February 26, 1998

Direction: West

Clay liner material was excavated from the west of the East Cell. Liner material consisted of clayey soils that met or exceeded hydraulic conductivity criteria of $K \leq 10^{-6}$ cm/sec.



Photograph #2

Date: February 26, 1998

Direction: Northeast

Clay liner material was placed and spread in fanning manner by CAT D-8 dozer and a West-Side dresser. Liner material was placed in 9-inch loose lifts in order to facilitate compaction.

By: Peter Cambouris

Subject: Feddeler C/D Landfill North Facility Sheet No: 2 of 3

Date: May 13, 1998

East Cell Clay Liner Construction

Job No: 0072-03-10



Photograph #3

Date: February 27, 1998

Direction: Northeast

Clay liner material was compacted to a minimum 95% of the maximum dry density as determined by ASTM 698-91.

Compaction was achieved by a sheepstoot roller.



Photograph #4

Date: February 27, 1998

Direction: North

Compaction testing was performed during the clay liner construction. Compaction testing was performed using a nuclear/density gauge in accordance with ASTM D 2922-3017.

By: Peter Cambouris

Subject: Feddeler C/D Landfill North Facility Sheet No: 3 of 3

Date: May 13, 1998

East Cell Clay Liner Construction

Job No: 0072-03-10



Photograph #5

Date: March 27, 1998

Direction: Southwest

Clay liner material was placed and compacted to a minimum 3-foot thickness.



Photograph #6

Date: March 27, 1998

Direction: East

Completed constructed clay liner possessed an in-place minimum hydraulic conductivity value of $K \leq 10^{-6}$ cm/s. Samples of compacted clay liner material were collected via Shelby Tube methods and laboratory permeability testing was performed on material per ASTM D5084.



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Daily Summary Report

Owner	Feddeler	Date	02-25-98	Day	Wednesday	Report No.:	1
Project	Feddeler Landfill	Weather A.M.	Overcast	P.M.	Overcast	Page:	1 of 1
			Light Breeze		Light Breeze		
Project #	97094.02	Temp(°F)High	48	Low	33	Precipitation:	None

Contractor(s): Feddeler's Operators.
Contractor Sub(s): None

Summary of Daily Construction Progress and Inspections:

Weaver Boos Representative observed Feddeler Landfill using on-site equipment and operators to construct clay liner for the East Cell, located north of the active waste areas. Clay material utilized for construction of liner was excavated, with a Kamatsu 400 backhoe, west of construction area and transported to the east cell with a Volvo BM A30 off-road truck. Feddeler placed clay material in east cell into 9-inch loose lifts using a WEST SIDE dresser and a CAT D8 LGP dozer. Clay liner material was unloaded on the north part of the cell and spread in a fanning manner from west to east. Each individual lift was compacted with a CAT sheeps foot compactor. Upon compaction of each lift of clay liner, nuclear density (ASTM D2922) and moisture content (ASTM D3017) testing was performed using a TROXLER field nuclear density gauge. A WBC representative performed 6 moisture/density tests on the liner at 95-percent Standard Proctor at a minimum frequency of 1 test per 10,000 sqft. Each of the 6 tests met the minimum 95-percent Standard Proctor for clay liner compaction established via laboratory soil analysis. Weaver Boos Representatives performed field surveying of east cell floor for elevations and coordinates. Temporary benchmarks were placed, in the vicinity of the cell, for future engineering purposes.

Summary of Problems and Resolutions:

Standing water on southern bottom of cell floor was pushed by dozers and pumped out of the cell.

Summary of Meeting(s) Held and Attendees:

Discussions held with Bill Feddeler concerning most efficient manner in construction of clay liner.

Personnel:

Peter Cambouris (WBC Rep.) Bill Feddeler Operations Manager, (Feddeler Landfill).

Equipment:

One Katmatsu 400 backhoe, one Volvo BM A30, one CAT D8 LGP Dozer, one CAT Sheeps Foot Compactor and one West Side Dresser.

Visitors:

None

Signature 
Peter Cambouris
Technician

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Daily Summary Report

Owner	Feddeler	Date	02-26-98	Day	Thursday	Report No.:	2
Project	Feddeler Landfill	Weather A.M.	Sunny	P.M.	Sunny	Page:	1 of 1
			Light Breeze		Breezy		
Project #	97094.02	Temp(°F)High	48	Low	33	Precipitation:	None

Contractor(s): Feddeler's Operators.

Contractor Sub(s): None

Summary of Daily Construction Progress and Inspections:

Weaver Boos Representative observed Feddeler Landfill using on-site equipment and operators to construct clay liner for the East Cell, located north of the active waste areas. Clay material utilized for construction of liner was excavated, with a Kamatsu 400 backhoe, west of construction area and transported to the east cell with a Volvo BM A30 off-road truck. Feddeler placed clay material in east cell into 9-inch loose lifts using a WEST SIDE dresser and a CAT D8 LGP dozer. Clay liner material was unloaded on the north part of the cell and spread in a fanning manner from west to east. Each individual lift was compacted with a CAT sheeps foot compactor. Upon compaction of each lift of clay liner, nuclear density (ASTM D2922) and moisture content (ASTM D3017) testing was performed using a TROXLER field nuclear density gauge. A WBC representative performed 6 moisture/density tests on the liner at 95-percent Standard Proctor at a minimum frequency of 1 test per 10,000 sqft. Each of the 6 tests met the minimum 95-percent Standard Proctor for clay liner compaction established via laboratory soil analysis

Summary of Problems and Resolutions:

Standing water on southern bottom of cell floor was pushed by dozers and pumped out of the cell.

Summary of Meeting(s) Held and Attendees:

Discussions held with Bill Feddeler concerning most efficient manner in construction of clay liner.

Personnel:

Peter Cambouris (WBC Rep.) Bill Feddeler Operations Manager, (Feddeler Landfill).


Equipment:

One Kamatsu 400 backhoe, one Volvo BM A30, one CAT D8 LGP Dozer, one CAT Sheeps Foot Compactor and one West Side Dresser.

Visitors:

None

Signature


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Technician

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Daily Summary Report

Owner	Feddeler	Date	02-27-98	Day	Friday	Report No.:	3
Project	Feddeler Landfill	Weather A.M.	Sunny	P.M.	Sunny	Page:	1 of 1
			Light Breeze		Breezy		
Project #	97094.02	Temp(°F)High	48	Low	39	Precipitation:	None

Contractor(s): Feddeler's Operators.

Contractor Sub(s): None

Summary of Daily Construction Progress and Inspections:

Weaver Boos Representative observed Feddeler Landfill using on-site equipment and operators to construct clay liner for the East Cell, located north of the active waste areas. Clay material utilized for construction of liner was excavated, with a Kamatsu 400 backhoe, west of construction area and transported to the east cell with a Volvo BM A30 off-road truck. Feddeler placed clay material in east cell into 9-inch loose lifts using a WEST SIDE dresser and a CAT D8 LGP dozer. Clay liner material was unloaded on the north part of the cell and spread in a fanning manner from west to east. Each individual lift was compacted with a CAT sheeps foot compactor. Upon compaction of each lift of clay liner, nuclear density (ASTM D2922) and moisture content (ASTM D3017) testing was performed using a TROXLER field nuclear density gauge. A WBC representative performed 7 moisture/density tests on the liner at 95-percent Standard Proctor at a minimum frequency of 1 test per 10,000 sqft. Each of the 7 tests met the minimum 95-percent Standard Proctor for clay liner compaction established via laboratory soil analysis

Summary of Problems and Resolutions:

Standing water on bottom of cell floor was pushed by dozers and pumped out of the cell.

Summary of Meeting(s) Held and Attendees:

None

Personnel:

Peter Cambouris (WBC Rep.) Bill Feddeler Operations Manager, (Feddeler Landfill).


Equipment:

One Katmatsu 400 backhoe, one Volvo BM A30, one CAT D8 LGP Dozer, one CAT Sheeps Foot Compactor and one West Side Dresser.

Visitors:

None

Signature


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Daily Summary Report

Owner	Feddeler	Date	03-02-98	Day	Monday	Report No.:	4
Project	Feddeler Landfill	Weather A.M.	Sunny	P.M.	Sunny	Page:	1 of 1
			Light Breeze		Breezy		
Project #	97094.02	Temp(°F)High	50	Low	43	Precipitation:	None

Contractor(s): Feddeler's Operators.

Contractor Sub(s): None

Summary of Daily Construction Progress and Inspections:

Weaver Boos Representative observed Feddeler Landfill using on-site equipment and operators to construct clay liner for the East Cell, located north of the active waste areas. Clay material utilized for construction of liner was excavated, with a Kamatsu 400 backhoe, west of construction area and transported to the east cell with a Volvo BM A30 off-road truck. Feddeler placed clay material in east cell into 9-inch loose lifts using a WEST SIDE dresser and a CAT D8 LGP dozer. Clay liner material was unloaded on the north part of the cell and spread in a fanning manner from west to east. Each individual lift was compacted with a CAT sheeps foot compactor.

Summary of Problems and Resolutions:

Standing water on southern bottom of cell floor was pushed by dozers and pumped out of the cell.

Summary of Meeting(s) Held and Attendees:

Discussions held with Bill Feddeler concerning most efficient manner in construction clay liner.

Personnel:

Peter Cambouris (WBC Rep.) Bill Feddeler Operations Manager, (Feddeler Landfill).

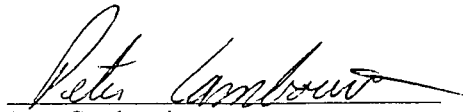
Equipment:

One Katmatsu 400 backhoe, one Volvo BM A30, one CAT D8 LGP Dozer, one CAT Sheeps Foot Compactor and one West Side Dresser.

Visitors:

None

Signature



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Daily Summary Report

Owner	Feddeler	Date	03-03-98	Day	Tuesday	Report No.:	5
Project	Feddeler Landfill	Weather A.M.	Partly Sunny Light Breeze	P.M.	Sunny Breezy	Page:	1 of 1
Project #	97094.02	Temp(°F)High	46	Low	37	Precipitation:	None

Contractor(s): Feddeler's Operators.

Contractor Sub(s): None

Summary of Daily Construction Progress and Inspections:

Weaver Boos Representative observed Feddeler Landfill using on-site equipment and operators to construct clay liner for the East Cell, located north of the active waste areas. Clay material utilized for construction of liner was excavated, with a Kamatsu 400 backhoe, west of construction area and transported to the east cell with a Volvo BM A30 off-road truck. Feddeler placed clay material in east cell into 9-inch loose lifts using a WEST SIDE dresser and a CAT D8 LGP dozer. Clay liner material was unloaded on the north part of the cell and spread in a fanning manner from west to east. Each individual lift was compacted with a CAT sheeps foot compactor.

Summary of Problems and Resolutions:

Standing water on southern bottom of cell floor was pushed by dozers and pumped out of the cell.

Summary of Meeting(s) Held and Attendees:

Personnel:

Peter Cambouris (WBC Rep.) Bill Feddeler Operations Manager, (Feddeler Landfill).

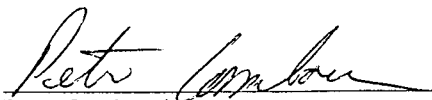
Equipment:

One Katmatsu 400 backhoe, one Volvo BM A30, one CAT D8 LGP Dozer, one CAT Sheeps Foot Compactor and one West Side Dresser.

Visitors:

None

Signature



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Daily Summary Report

Owner	Feddeler	Date	03-04-98	Day	Wednesday	Report No.:	6
Project	Feddeler Landfill	Weather A.M.	Sunny Light Breeze	P.M.	Sunny Breezy	Page:	1 of 1
Project #	97094.02	Temp(°F)High	48	Low	39	Precipitation:	None

Contractor(s): Feddeler's Operators.

Contractor Sub(s): None

Summary of Daily Construction Progress and Inspections:

Weaver Boos Representative observed Feddeler Landfill using on-site equipment and operators to construct clay liner for the East Cell, located north of the active waste areas. Clay material utilized for construction of liner was excavated, with a Kamatsu 400 backhoe, west of construction area and transported to the east cell with a Volvo BM A30 off-road truck. Feddeler placed clay material in east cell into 9-inch loose lifts using a WEST SIDE dresser and a CAT D8 LGP dozer. Clay liner material was unloaded on the north part of the cell and spread in a fanning manner from west to east. Each individual lift was compacted with a CAT sheeps foot compactor.

Summary of Problems and Resolutions:

Standing water on southern bottom of cell floor was pushed by dozers and pumped out of the cell.

Summary of Meeting(s) Held and Attendees:

Discussions held with Bill Feddeler concerning most efficient manner in construction clay liner.

Personnel:

Peter Cambouris (WBC Rep.) Bill Feddeler Operations Manager, (Feddeler Landfill).

Equipment:

One Katmatsu 400 backhoe, one Volvo BM A30, one CAT D8 LGP Dozer, one CAT Sheeps Foot Compactor and one West Side Dresser.

Visitors:

None

Signature Peter Cambouris
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Daily Summary Report

Owner	Feddeler	Date	03-06-98	Day	Friday	Report No.:	7
Project	Feddeler Landfill	Weather A.M.	Partly Cloudy Breezy	P.M.	Partly Cloudy St Breeze	Page:	1 of 1
Project #	97094.02	Temp(°F)High	48	Low	39	Precipitation:	None

Contractor(s): Feddeler's Operators.

Contractor Sub(s): None

Summary of Daily Construction Progress and Inspections:

Weaver Boos Representative observed Feddeler Landfill using on-site equipment and operators to construct clay liner for the East Cell, located north of the active waste areas. Clay material utilized for construction of liner was excavated, with a Kamatsu 400 backhoe, west of construction area and transported to the east cell with a Volvo BM A30 off-road truck. Feddeler placed clay material in east cell into 9-inch loose lifts using a WEST SIDE dresser and a CAT D8 LGP dozer. Clay liner material was unloaded on the north part of the cell and spread in a fanning manner from west to east. Each individual lift was compacted with a CAT sheeps foot compactor. Upon compaction of each lift of clay liner, nuclear density (ASTM D2922) and moisture content (ASTM D3017) testing was performed using a TROXLER field nuclear density gauge. A WBC representative performed 6 moisture/density tests on the liner at 95-percent Standard Proctor at a minimum frequency of 1 test per 10,000 sqft. Each of the 6 tests met the minimum 95-percent Standard Proctor for clay liner compaction established via laboratory soil analysis

Summary of Problems and Resolutions:

Standing water on southern bottom of cell floor was pushed by dozers and pumped out of the cell.

Summary of Meeting(s) Held and Attendees:

Discussions held with Bill Feddeler concerning most efficient manner in construction of clay liner.

Personnel:

Peter Cambouris (WBC Rep.) Bill Feddeler Operations Manager, (Feddeler Landfill).

Equipment:

One Kamatsu 400 backhoe, one Volvo BM A30, one CAT D8 LGP Dozer, one CAT Sheeps Foot Compactor and one West Side Dresser.

Visitors:

None

Signature



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Daily Summary Report

Owner	Feddeler	Date	03-23-98	Day	Monday	Report No.:	8
Project	Feddeler Landfill	Weather A.M.	Overcast Light Breeze	P.M.	Overcast Light Breeze	Page:	1 of 1
Project #	97094.02	Temp(°F)High	49	Low	35	Precipitation:	None

Contractor(s): Feddeler's Operators.
Contractor Sub(s): None

Summary of Daily Construction Progress and Inspections:

Weaver Boos Representative observed Feddeler Landfill using on-site equipment and operators to construct clay liner for the East Cell, located north of the active waste areas. Clay material utilized for construction of liner was excavated, with a Kamatsu 400 backhoe, west of construction area and transported to the east cell with a Volvo BM A30 off-road truck. Feddeler placed clay material in east cell into 9-inch loose lifts using a WEST SIDE dresser and a CAT D8 LGP dozer. Clay liner material was unloaded on the middle to south part of the cell and spread in a fanning manner from east to west. Each individual lift was compacted with a CAT sheeps foot compactor. Upon compaction of each lift of clay liner, nuclear density (ASTM D2922) and moisture content (ASTM D3017) testing was performed using a TROXLER field nuclear density gauge. A WBC representative performed 5 moisture/density tests on the liner at 95-percent Standard Proctor at a minimum frequency of 1 test per 10,000 sqft. Each of the 5 tests met the minimum 95-percent Standard Proctor for clay liner compaction established via laboratory soil analysis

Summary of Problems and Resolutions:

Summary of Meeting(s) Held and Attendees:

Discussions held with Bill Feddeler concerning most efficient manner in construction of clay liner.

Personnel:

Peter Cambouris (WBC Rep.) Bill Feddeler Operations Manager, (Feddeler Landfill).


Equipment:

One Katmatsu 400 backhoe, one Volvo BM A30, one CAT D8 LGP Dozer, one CAT Sheeps Foot Compactor and one West Side Dresser.

Visitors:

None

Signature


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Technician

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Daily Summary Report

Owner	Feddeler	Date	03-24-98	Day	Tuesday	Report No.:	9
Project	Feddeler Landfill	Weather A.M.	Overcast	P.M.	Overcast	Page:	1 of 1
			Light Breeze		Light Breeze		
Project #	97094.02	Temp(°F)High	40	Low	33	Precipitation:	None

Contractor(s): Feddeler's Operators.

Contractor Sub(s): None

Summary of Daily Construction Progress and Inspections:

Weaver Boos Representative observed Feddeler Landfill using on-site equipment and operators to construct clay liner for the East Cell, located north of the active waste areas. Clay material utilized for construction of liner was excavated, with a Kamatsu 400 backhoe, west of construction area and transported to the east cell with a Volvo BM A30 off-road truck. Feddeler placed clay material in east cell into 9-inch loose lifts using a WEST SIDE dresser and a CAT D8 LGP dozer. Clay liner material was unloaded on the middle to south part of the cell and spread in a fanning manner from east to west. Each individual lift was compacted with a CAT sheeps foot compactor. Upon compaction of each lift of clay liner, nuclear density (ASTM D2922) and moisture content (ASTM D3017) testing was performed using a TROXLER field nuclear density gauge. A WBC representative performed 4 moisture/density tests on the liner at 95-percent Standard Proctor at a minimum frequency of 1 test per 10,000 sqft. Each of the 4 tests met the minimum 95-percent Standard Proctor for clay liner compaction established via laboratory soil analysis

Summary of Problems and Resolutions:

Summary of Meeting(s) Held and Attendees:

Discussions held with Bill Feddeler concerning most efficient manner in construction of clay liner.

Personnel:

Peter Cambouris (WBC Rep.) Bill Feddeler Operations Manager, (Feddeler Landfill).


Equipment:

One Kamatsu 400 backhoe, one Volvo BM A30, one CAT D8 LGP Dozer, one CAT Sheeps Foot Compactor and one West Side Dresser.

Visitors:

None

Signature


Peter Cambouris
Technician

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Daily Summary Report

Owner	Feddeler	Date	03-25-98	Day	Wednesday	Report No.:	10
Project	Feddeler CVD Landfill	Weather A.M.	Overcast Light Breeze	P.M.	Overcast Light Breeze	Page:	1 of 1
Project #	97094.02	Temp(°F)High	41	Low	34	Precipitation:	None

Contractor(s): Feddeler's Operators.
Contractor Sub(s): None

Summary of Daily Construction Progress and Inspections:

Weaver Boos Representative observed Feddeler Landfill using on-site equipment and operators to construct clay liner for the East Cell, located north of the active waste areas. Clay material utilized for construction of liner was excavated, with a Kamatsu 400 backhoe, west of construction area and transported to the east cell with a Volvo BM A30 off-road truck. Feddeler placed clay material in east cell into 9-inch loose lifts using a WEST SIDE dresser and a CAT D8 LGP dozer. Clay liner material was unloaded on the middle to south part of the cell and spread in a fanning manner from east to west. Each individual lift was compacted with a CAT sheeps foot compactor. Upon compaction of each lift of clay liner, nuclear density (ASTM D2922) and moisture content (ASTM D3017) testing was performed using a TROXLER field nuclear density gauge. A WBC representative performed 3 moisture/density tests on the liner at 95-percent Standard Proctor at a minimum frequency of 1 test per 10,000 sqft. Each of the 3 tests met the minimum 95-percent Standard Proctor for clay liner compaction established via laboratory soil analysis

Summary of Problems and Resolutions:

Summary of Meeting(s) Held and Attendees:

Discussions held with Bill Feddeler concerning most efficient manner in construction of clay liner.

Personnel:

Peter Cambouris (WBC Rep.) Bill Feddeler Operations Manager, (Feddeler Landfill).


Equipment:

One Katmatsu 400 backhoe, one Volvo BM A30, one CAT D8 LGP Dozer, one CAT Sheeps Foot Compactor and one West Side Dresser.

Visitors:

None

Signature


Peter Cambouris
Technician

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Daily Summary Report

Owner	Feddeler	Date	03-26-98	Day	Thursday	Report No.:	11
Project	Feddeler Landfill	Weather A.M.	Overcast	P.M.	Overcast	Page:	1 of 1
			Light Breeze		Light Breeze		
Project #	97094.02	Temp(°F)High	44	Low	31	Precipitation:	None

Contractor(s): Feddeler's Operators.
Contractor Sub(s): None

Summary of Daily Construction Progress and Inspections:

Weaver Boos Representative observed Feddeler Landfill using on-site equipment and operators to construct clay liner for the East Cell, located north of the active waste areas. Clay material utilized for construction of liner was excavated, with a Kamatsu 400 backhoe, west of construction area and transported to the east cell with a Volvo BM A30 off-road truck. Feddeler placed clay material in east cell into 9-inch loose lifts using a WEST SIDE dresser and a CAT D8 LGP dozer. Clay liner material was unloaded on the middle to south part of the cell and spread in a fanning manner from east to west. Each individual lift was compacted with a CAT sheeps foot compactor. Upon compaction of each lift of clay liner, nuclear density (ASTM D2922) and moisture content (ASTM D3017) testing was performed using a TROXLER field nuclear density gauge. A WBC representative performed 3 moisture/density tests on the liner at 95-percent Standard Proctor at a minimum frequency of 1 test per 10,000 sqft. Each of the 3 tests met the minimum 95-percent Standard Proctor for clay liner compaction established via laboratory soil analysis

Summary of Problems and Resolutions:

Summary of Meeting(s) Held and Attendees:

Discussions held with Bill Feddeler concerning most efficient manner in construction of clay liner.

Personnel:

Peter Cambouris (WBC Rep.) Bill Feddeler Operations Manager, (Feddeler Landfill).

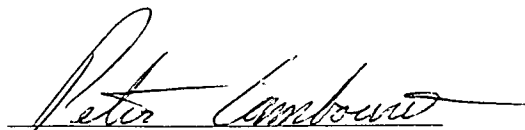
Equipment:

One Katmatsu 400 backhoe, one Volvo BM A30, one CAT D8 LGP Dozer, one CAT Sheeps Foot Compactor and one West Side Dresser.

Visitors:

None

Signature


Peter Cambouris
Technician

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Daily Summary Report

Owner: Feddeler **Date:** 03-27-98 **Day:** Friday **Report No.:** 12
Project: Feddeler C/D Landfill **Weather:** A.M. Sunny/Lt. Breeze P.M. Sunny/Breezy **Page:** 1 of 1
Project No.: 97094.02 **Temp.(°F):** High: 41 Low: 39 **Precipitation:** None

Contractor(s): Feddeler's Operators.
Contractor Sub(s): None

Summary of Daily Construction Progress and Inspections:

Weaver Boos Representative observed Feddeler Landfill using on-site equipment and operators to construct clay liner for the East Cell, located north of the active waste areas. Clay material utilized for construction of liner was excavated, with a Kamatsu 400 backhoe, west of construction area and transported to the east cell with a Volvo BM A30 off-road truck. Feddeler placed clay material in east cell into 9-inch loose lifts using a WEST SIDE dresser and a CAT D8 LGP dozer. Clay liner material was unloaded on the middle to south part of the cell and spread in a fanning manner from east to west. Each individual lift was compacted with a CAT sheeps foot compactor. Upon compaction of each lift of clay liner, nuclear density (ASTM D2922) and moisture content (ASTM D3017) testing was performed using a TROXLER field nuclear density gauge. A WBC representative performed 2 moisture/density tests on the liner at 95-percent Standard Proctor at a minimum frequency of 1 test per 10,000 sqft. Each of the 2 tests met the minimum 95-percent Standard Proctor for clay liner compaction established via laboratory soil analysis

Summary of Problems and Resolutions:

Standing water on southern bottom of cell floor was pushed by dozers and pumped out of the cell.

Summary of Meeting(s) Held and Attendees:

Discussions held with Bill Feddeler concerning most efficient manner in construction of clay liner.

Personnel:

Peter Cambouris (WBC Rep.) Bill Feddeler, Operations Manager, (Feddeler Landfill).


Equipment:

One Katmatsu 400 backhoe, one Volvo BM A30, one CAT D8 LGP Dozer, one CAT Sheeps Foot Compactor and one West Side Dresser.

Visitors:

None

Signature


Peter Cambouris
Technician

WEAVER BOOS CONSULTANTS, INC.

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Phone: (312) 922-1030 Fax: (312) 922-0201

213 S. Camino Del Pueblo, Bernalillo, NM 87114
Phone: (505) 890-0573 Fax: (505) 890-0534

Daily Summary Report

Owner: Feddeler *Date:* 03-30-98 *Day:* Monday *Report No.:* 13
Project: Feddeler Landfill *Weather:* A.M. Sunny/Mod. Breeze P.M. Sunny/Lt. Breezy *Page:* 1 of 1
Project No.: 97094.02 *Temp.(°F):* High: 71 Low: 62 *Precipitation:* None

Contractor(s): Feddeler's Operators.
Contractor Sub(s): None

Summary of Daily Construction Progress and Inspections:

Weaver Boos Representative observed Feddeler Landfill using on-site equipment and operators to construct clay liner for the East Cell, located north of the active waste areas. Clay material utilized for construction of liner was excavated, with a Kamatsu 400 backhoe, west of construction area and transported to the east cell with a Volvo BM A30 off-road truck. Feddeler placed clay material in east cell into 9-inch loose lifts using a WEST SIDE dresser and a CAT D8 LGP dozer. Clay liner material was unloaded on the middle to south part of the cell and spread in a fanning manner from east to west. Each individual lift was compacted with a CAT sheeps foot compactor. Upon compaction of each lift of clay liner, nuclear density (ASTM D2922) and moisture content (ASTM D3017) testing was performed using a TROXLER field nuclear density gauge. A WBC representative performed 7 moisture/density tests on the liner at 95-percent Standard Proctor at a minimum frequency of 1 test per 10,000 sqft. Of the 7 tests, 6 met the minimum 95-percent Standard Proctor for clay liner compaction established via laboratory soil analysis

Summary of Problems and Resolutions:

Summary of Meeting(s) Held and Attendees:

Discussions held with Bill Feddeler concerning most efficient manner in construction of clay liner.

Personnel:

Peter Cambouris (WBC Rep.) Bill Feddeler Operations Manager, (Feddeler Landfill).

Equipment:

One Katmatsu 400 backhoe, one Volvo BM A30, one CAT D8 LGP Dozer, one CAT Sheeps Foot Compactor and one West Side Dresser.

Visitors:

None

Signature



Peter Cambouris
Technician

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Daily Summary Report

Owner: Feddeler **Date:** 04-20-98 **Day:** Monday **Report No.:** 14
Project: Feddeler C/D Landfill **Weather:** A.M. Sunny/Lt. Breeze **P.M.** Sunny/Breezy **Page:** 1 of 1
Project No.: 97094.02 **Temp.(°F):** High: 69 Low: 57 **Precipitation:** None

Contractor(s): Feddeler's Operators.
Contractor Sub(s): None

Summary of Daily Construction Progress and Inspections:

Weaver Boos Representative observed Feddeler Landfill using on-site equipment and operators to construct clay liner for the East Cell, located north of the active waste areas. Clay material utilized for construction of liner was excavated, with a Kamatsu 400 backhoe, west of construction area and transported to the east cell with a Volvo BM A30 off-road truck. Feddeler placed clay material in east cell into 9-inch loose lifts using a WEST SIDE dresser and a CAT D8 LGP dozer. Clay liner material was unloaded on the south part of the cell and spread in a fanning manner from east to west. Each individual lift was compacted with a CAT sheeps foot compactor. Upon compaction of each lift of clay liner, nuclear density (ASTM D2922) and moisture content (ASTM D3017) testing was performed using a TROXLER field nuclear density gauge. A WBC representative performed 25 moisture/density tests on the liner at 95-percent Standard Proctor at a minimum frequency of 1 test per 10,000 sqft. Of the 25 tests, all 25 met the minimum 95-percent Standard Proctor for clay liner compaction established via laboratory soil analysis

Summary of Problems and Resolutions:

Summary of Meeting(s) Held and Attendees:

Discussions held with Bill Feddeler concerning most efficient manner in construction of clay liner.

Personnel:

Peter Cambouris (WBC Rep.) Bill Feddeler Operations Manager, (Feddeler Landfill).


Equipment:

One Kamatsu 400 backhoe, one Volvo BM A30, one CAT D8 LGP Dozer, one CAT Sheeps Foot Compactor and one West Side Dresser.

Visitors:

None

Signature


Peter Cambouris
Technician

Appendix A

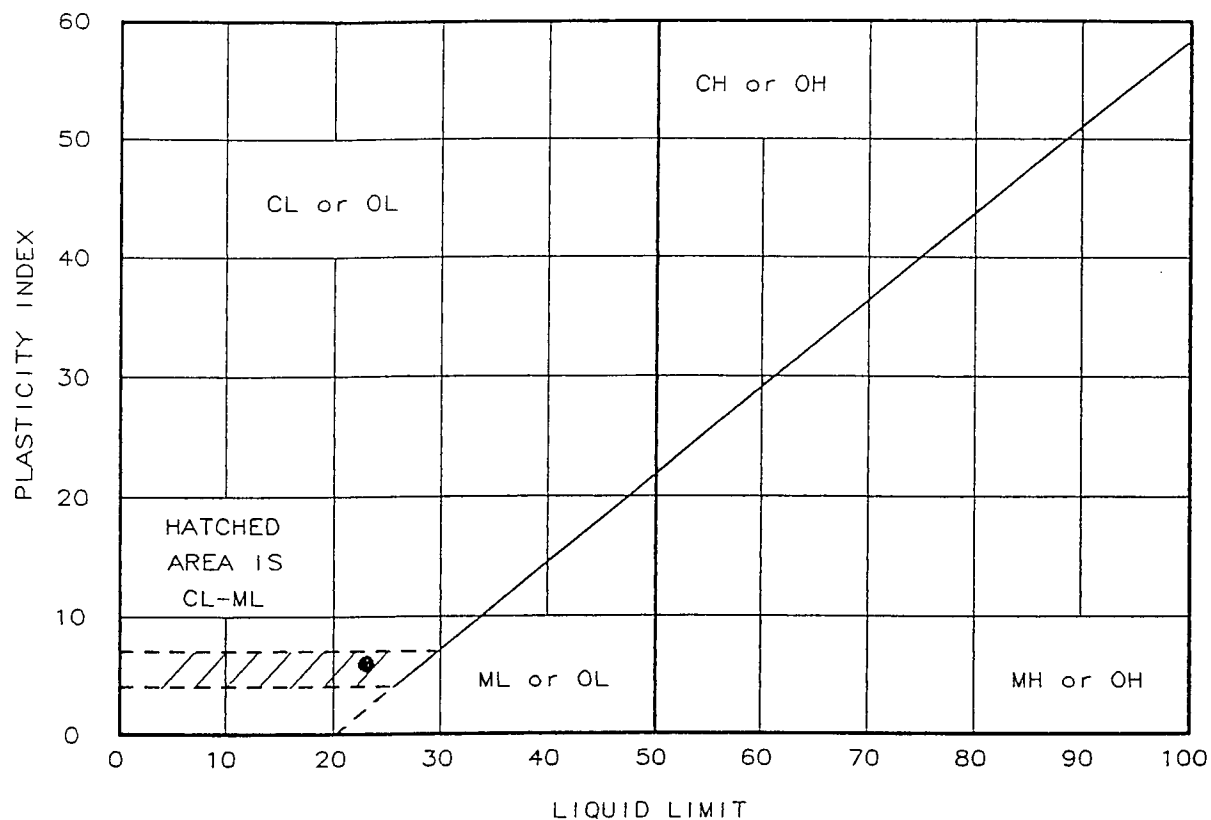
- Soils Evaluation Log
- Liquid and Plastic Limits Test
- Grain Size Distribution Test
- Moisture-Density Relationship Test
- Permeability Test

SOILS EVALUATION LOG

Feddeler C/D Landfill
North Facility East Cell
State Road 2
Lowell, Indiana

[illegible]

LIQUID AND PLASTIC LIMITS TEST REPORT



Location + Description	LL	PL	PI	-200	USCS	AASHTO
• BRN SILTY CLAY, SOME SAND TR FINE GRAVEL	23	17	6	64.4	CL-ML	A-4(1)

Project No.: 97094.02
Project: FEDDELER LANDFILL

Client: R & M DISPOSAL
Location: LOWELL, INDIANA

Date: 2-23-98

Remarks:
S-1

LIQUID AND PLASTIC LIMITS TEST REPORT
WEAVER BOOS CONSULTANTS, INC.

Fig. No. _____

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LIQUID & PLASTIC LIMIT TEST DATA

=====

PROJECT DATA

Project No.: 97094.02 Date: 2-23-98
 Client: R & M DISPOSAL
 Project: FEDDELER LANDFILL
 Project location: LOWELL, INDIANA
 Remarks: S-1

Figure no.:

TEST DATA - Test number 1

Location and description: BRN SILTY CLAY, SOME SAND
 TR FINE GRAVEL

Run No.	1	2	3	4	37
WT w+t	40.8	38.6	39.4		W 35
WT d+t	35.7	34.4	35.1		A 35
WT tare	15.8	15.9	15.3		T 33
# Blows	7	28	46		E 33
Moisture	25.6	22.7	21.7		R 31

Run No.	1	2	3	27	25	1
WT w+t	41.9	40.9		W 25		
WT d+t	38.2	37.2		A 23		
WT tare	16.0	15.6		T 23		
Moisture	16.7	17.1		E 21		

Liquid Limit = 23

Plastic Limit = 17

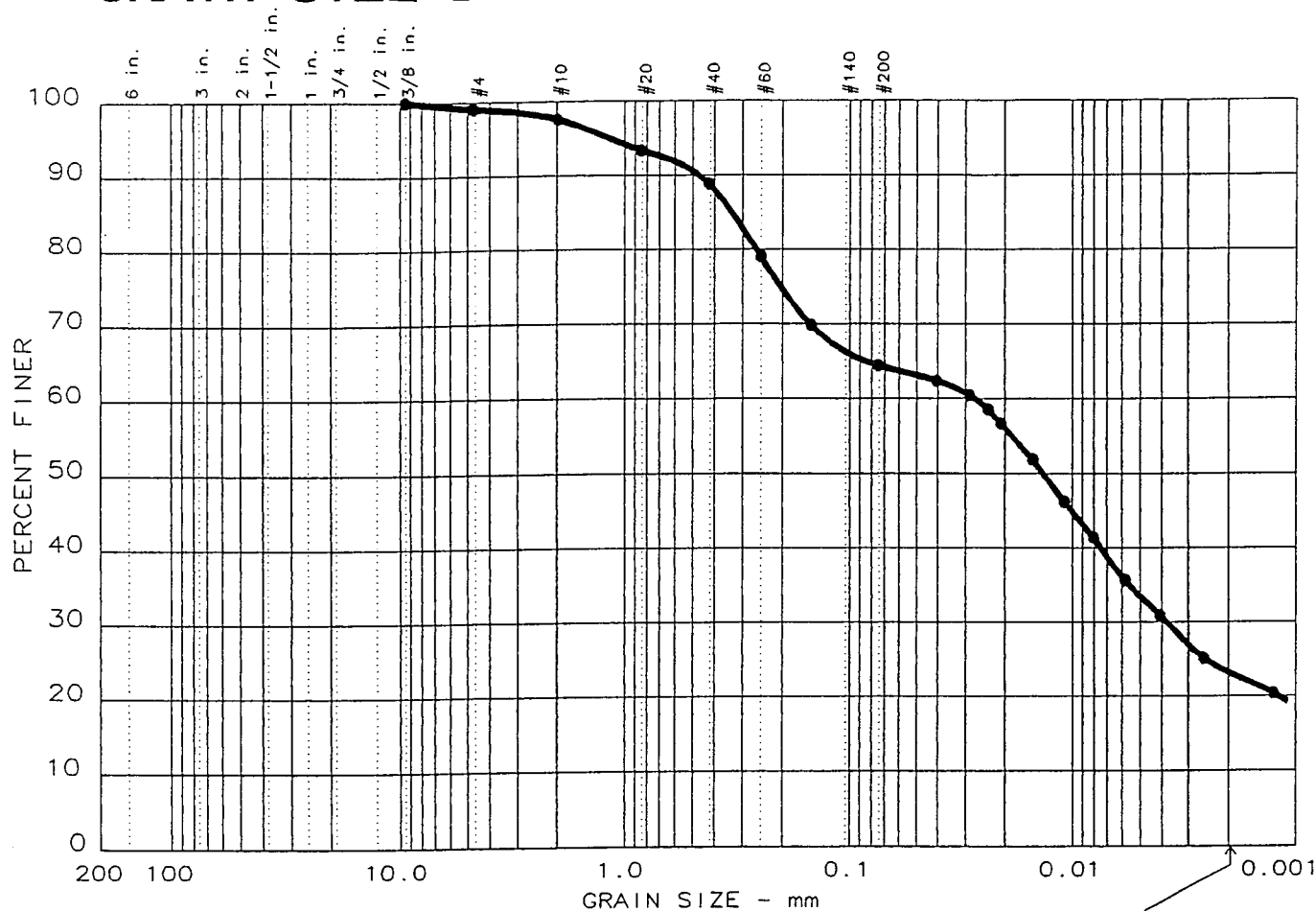
Plasticity Index = 6

CLASSIFICATION DATA

%-4 = 99.1	%-10 = 97.6	%-40 = 88.8	%-200 = 64.4
Uniformity Coefficient =		Curvature Coefficient =	
LL = 23	PL = 17	PI = 6	LL (oven dry) =
ASTM = CL-ML, Sandy silty clay			
AASHTO = A-4(1)			

WEAVER BOOS CONSULTANTS, INC.

GRAIN SIZE DISTRIBUTION TEST REPORT



Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
• 1	0.0	0.9	34.6	41.3	23.2

LL	PI	D ₈₅	D ₆₀	D ₅₀	D ₃₀	D ₁₅	D ₁₀	C _c	C _u
• 23	6	0.335		0.0135	0.0038				

MATERIAL DESCRIPTION	USCS	AASHTO
• BRN SILTY CLAY, SOME SAND, TR FINE GRAVEL	CL-ML	A-4

Project No.: 97094.02
 Project: FEDDELER LANDFILL
 • Location: LOWELL, INDIANA

Date: 2-25-98

GRAIN SIZE DISTRIBUTION TEST REPORT
WEAVER BOOS CONSULTANTS, INC.

Remarks:
 S-1

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST DATA

Test No.: 1

Date: 2-25-98

Project No.: 97094.02

Project: FEDDELER LANDFILL

Sample Data

Location of Sample: LOWELL, INDIANA

Sample Description: BRN SILTY CLAY, SOME SAND, TR FINE GRAVEL

USCS Class: CL-ML

Liquid limit: 23

AASHTO Class: A-4

Plasticity index: 6

Notes

Remarks: S-1

Fig. No.:

Mechanical Analysis Data

Initial

Dry sample and tare= 362.80

Tare = 0.00

Dry sample weight = 362.80

Sample split on number 10 sieve

Split sample data:

Sample and tare = 50 Tare = 0 Sample weight = 50

Cumulative weight retained tare= 0

Tare for cumulative weight retained= 0

Sieve	Cumul. Wt. retained	Percent finer
-------	------------------------	------------------

0.375 inches	0.00	100.0
--------------	------	-------

# 4	3.40	99.1
-----	------	------

# 10	8.60	97.6
------	------	------

# 20	2.20	93.3
------	------	------

# 40	4.50	88.8
------	------	------

# 60	9.50	79.1
------	------	------

# 100	14.20	69.9
-------	-------	------

# 200	17.00	64.4
-------	-------	------

Hydrometer Analysis Data

Separation sieve is number 10

Percent -# 10 based on complete sample= 97.6

Weight of hydrometer sample: 50

Calculated biased weight= 51.21

Automatic temperature correction

Composite correction at 20 deg C =-4

Meniscus correction only= 1

Specific gravity of solids= 2.75

Specific gravity correction factor= 0.978

Hydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	23.0	36.0	32.7	0.0128	37.0	10.2	0.0408	62.4
2.0	23.0	35.0	31.7	0.0128	36.0	10.4	0.0291	60.5
3.0	23.0	34.0	30.7	0.0128	35.0	10.6	0.0240	58.6
4.0	23.0	33.0	29.7	0.0128	34.0	10.7	0.0209	56.7
8.0	23.0	30.5	27.2	0.0128	31.5	11.1	0.0151	51.9
16.0	23.0	27.5	24.2	0.0128	28.5	11.6	0.0109	46.2
30.0	23.0	25.0	21.7	0.0128	26.0	12.0	0.0081	41.4
60.0	23.0	22.0	18.7	0.0128	23.0	12.5	0.0058	35.7
125.0	23.0	19.5	16.2	0.0128	20.5	12.9	0.0041	30.9
330.0	23.0	16.5	13.2	0.0128	17.5	13.4	0.0026	25.2
1410.0	23.0	14.0	10.7	0.0128	15.0	13.8	0.0013	20.4
2850.0	23.0	12.5	9.2	0.0128	13.5	14.1	0.0009	17.5

Fractional Components

Gravel/Sand based on #4 sieve

Sand/Fines based on #200 sieve

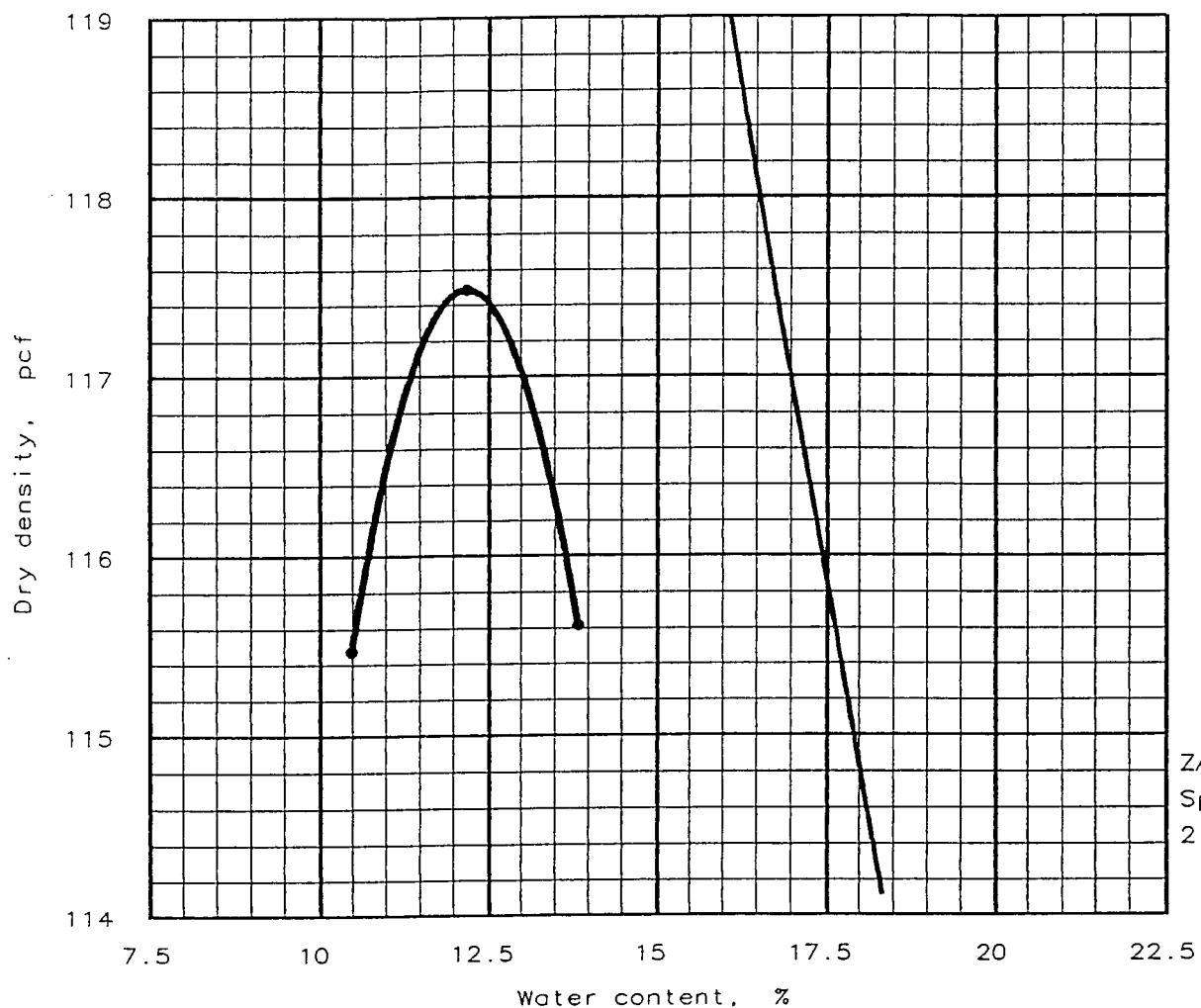
% + 3 in. = 0.0 % GRAVEL = 0.9 % SAND = 34.6

% SILT = 41.3 % CLAY = 23.2 (% CLAY COLLOIDS = 18.5)

D85= 0.33 D60= 0.027 D50= 0.013

D30= 0.0038

MOISTURE-DENSITY RELATIONSHIP TEST



ZAV for
Sp.G. =
2.75

Test specification: ASTM D 698-91 Procedure A, Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No. 4	% < No. 200
	USCS	AASHTO						
	CL-ML	A-4		2.75	23	6	0.9 %	64.4 %

TEST RESULTS				MATERIAL DESCRIPTION			
Maximum dry density = 117.5 pcf Optimum moisture = 12.2 %				BRN SILTY CLAY, SOME SAND, TR FINE GRAVEL			
Project No.: 97094.02 Project: FEDDELER LANDFILL Location: LOWELL, INDIANA Date: 2-20-98				Remarks: S-1			
MOISTURE-DENSITY RELATIONSHIP TEST WEAVER BOOS CONSULTANTS, INC.				Fig. No. _____			

===== MOISTURE-DENSITY TEST DATA

DATA FILE: 1
=====

PROJECT DATA

Date: 2-20-98
 Project no.: 97094.02
 Project: FEDDELER LANDFILL
 Location 1: LOWELL, INDIANA
 2:
 Remarks 1: S-1
 3:
 Material 1: BRN SILTY CLAY, SOME
 Description 2: SAND, TR FINE GRAVEL
 Elevation or depth:
 Fig no:

----- SPECIMEN DATA

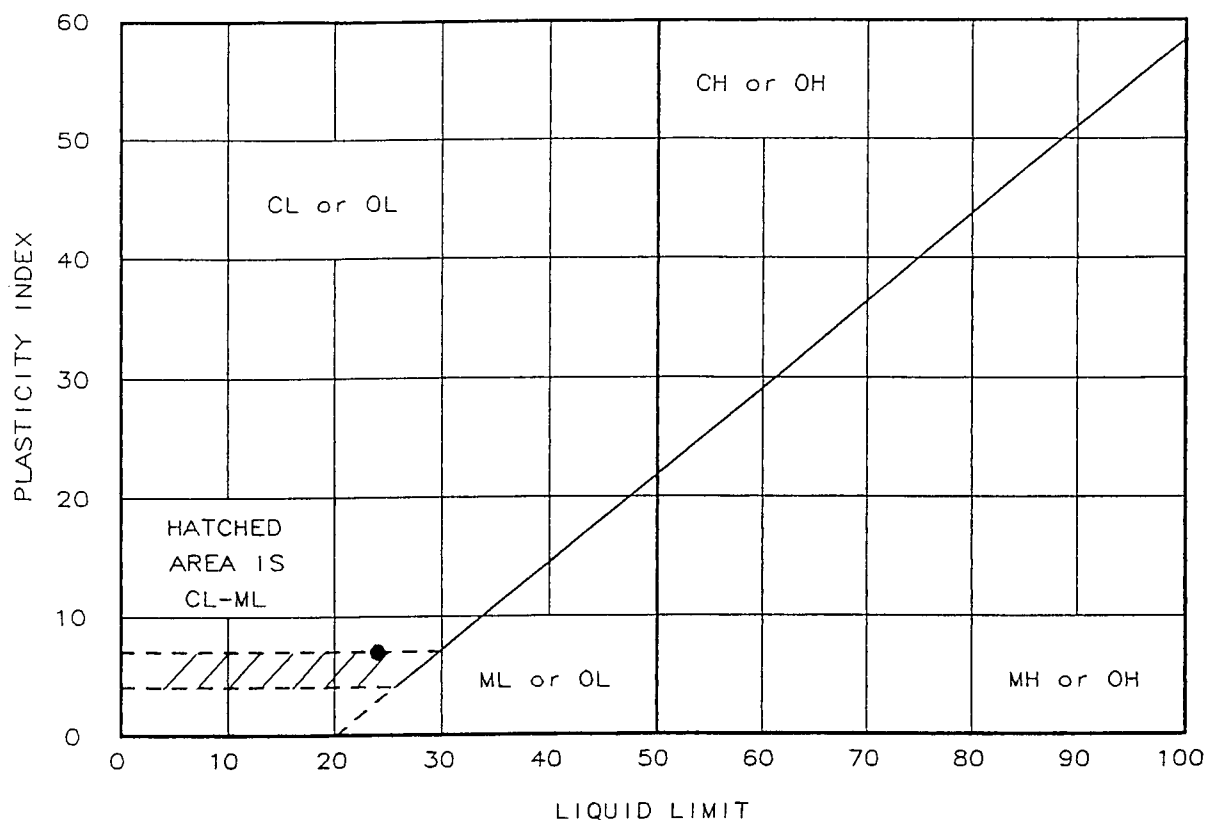
SCS classification: CL-ML AASHTO classification: A-4
 Natural moisture: Specific gravity: 2.75
 Percent retained on No.4 sieve: 0.9
 Percent passing No. 200 sieve: 64.4
 Liquid limit: 23 Plastic limit: 17 Plasticity index: 6

----- TEST DATA AND RESULTS

Type of test: Standard, ASTM D 698-91 Procedure A

Max dry den= 117.5 pcf
 Opt moisture= 12.2 %

LIQUID AND PLASTIC LIMITS TEST REPORT



Location + Description	LL	PL	PI	-200	USCS	AASHTO
● BRN, TR GRAY SILTY CLAY AND SAND	24	17	7	63.4	CL-ML	A-4(2)

Project No.: 97094.02
 Project: FEDDELER LANDFILL
 Client: R & M DISPOSAL
 Location: LOWELL, INDIANA

Date: 2-23-98

Remarks:

S-2

LIQUID AND PLASTIC LIMITS TEST REPORT
WEAVER BOOS CONSULTANTS, INC.

Fig. No. _____

LIQUID & PLASTIC LIMIT TEST DATA

PROJECT DATA

Project No.: 97094.02 Date: 2-23-98
 Client: R & M DISPOSAL
 Project: FEDDELER LANDFILL
 Project location: LOWELL, INDIANA
 Remarks: S-2

Figure no.:

TEST DATA - Test number 1

Location and description: BRN, TR GRAY SILTY CLAY
 AND SAND

Run No.	1	2	3	4	38
LIQUID LIMITS					
WT w+t	37.2	41.5	41.5		W
WT d+t	32.6	36.5	36.7		A 36
WT tare	15.7	16.0	14.9		T
# Blows	9	26	46		E 34
Moisture	27.2	24.4	22.0		R

Run No.	1	2	3	28
PLASTIC LIMITS				
WT w+t	40.7	40.0		W
WT d+t	36.9	36.4		A 36
WT tare	14.8	15.3		T
Moisture	17.2	17.1		E 34

Liquid Limit = 24
 Plastic Limit = 17
 Plasticity Index = 7

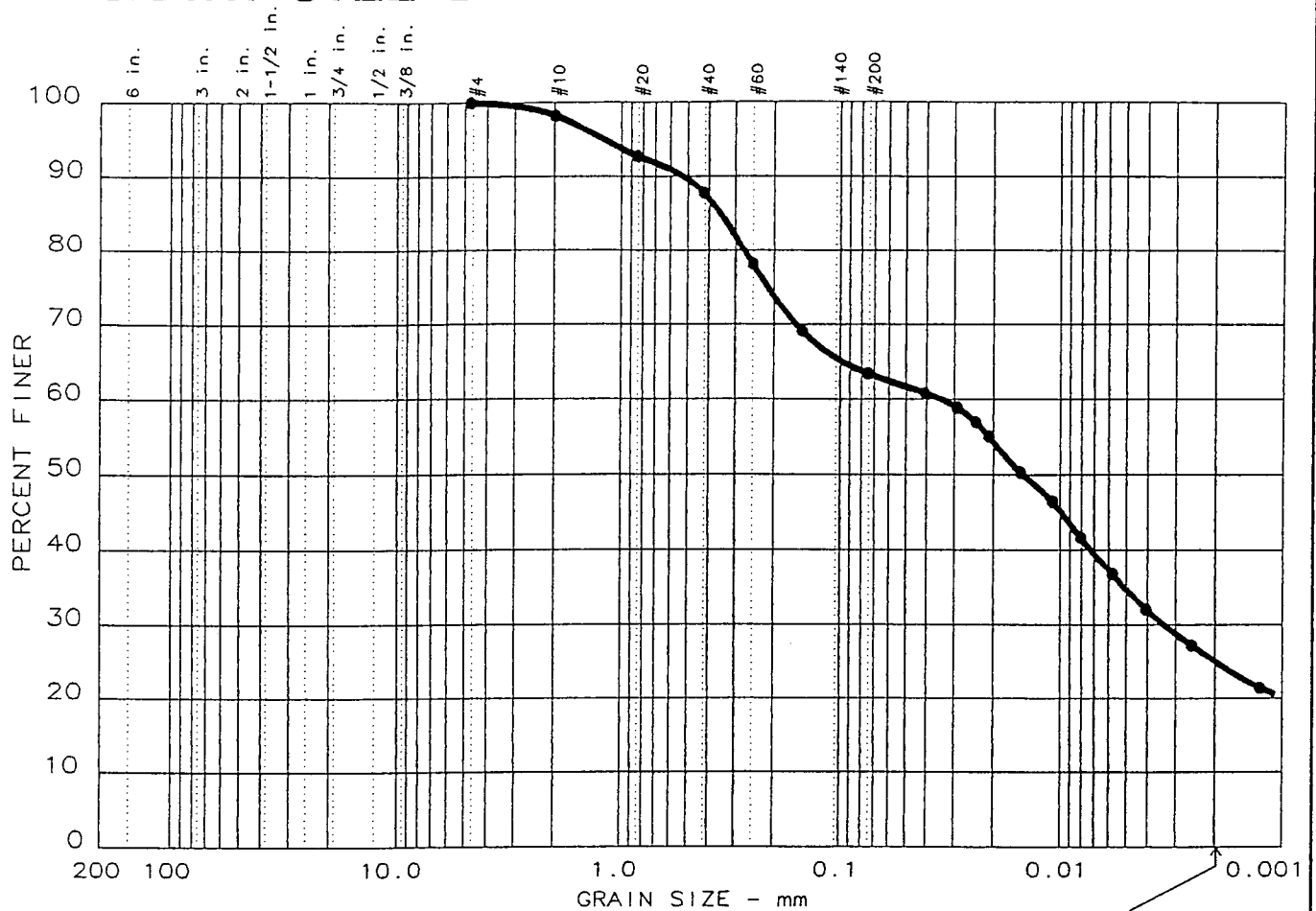
NUMBER OF BLOWS

CLASSIFICATION DATA

%-4 = 100.0 %-10 = 98.2 %-40 = 87.8 %-200 = 63.4
 Uniformity Coefficient = Curvature Coefficient =
 LL = 24 PL = 17 PI = 7 LL (oven dry) =
 ASTM = CL-ML, Sandy silty clay
 AASHTO = A-4(2)

WEAVER BOOS CONSULTANTS, INC.

GRAIN SIZE DISTRIBUTION TEST REPORT



GRAIN SIZE DISTRIBUTION TEST DATA

Test No.: 2

Date: 2-25-98

Project No.: 97094.02

Project: FEDDELER LANDFILL

Sample Data

Location of Sample: LOWELL, INDIANA

Sample Description: BRN, TR GRAY SILTY CLAY AND SAND

USCS Class: CL-ML

Liquid limit: 24

AASHTO Class: A-4

Plasticity index: 7

Notes

Remarks: S-2

Fig. No.:

Mechanical Analysis Data

Initial

Dry sample and tare= 336.20

Tare = 0.00

Dry sample weight = 336.20

Sample split on number 10 sieve

Split sample data:

Sample and tare = 50 Tare = 0 Sample weight = 50

Cumulative weight retained tare= 0

Tare for cumulative weight retained= 0

Sieve	Cumul. Wt. retained	Percent finer
# 4	0.00	100.0
# 10	6.00	98.2
# 20	2.80	92.7
# 40	5.30	87.8
# 60	10.20	78.2
# 100	14.80	69.1
# 200	17.70	63.4

Hydrometer Analysis Data

Separation sieve is number 10

Percent -# 10 based on complete sample= 98.2

Weight of hydrometer sample: 50

Calculated biased weight= 50.91

Automatic temperature correction

Composite correction at 20 deg C = -4

Meniscus correction only= 1

Specific gravity of solids= 2.75

Specific gravity correction factor= 0.978

Hydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	23.0	35.0	31.7	0.0128	36.0	10.4	0.0412	60.9
2.0	23.0	34.0	30.7	0.0128	35.0	10.6	0.0293	58.9
3.0	23.0	33.0	29.7	0.0128	34.0	10.7	0.0241	57.0
4.0	23.0	32.0	28.7	0.0128	33.0	10.9	0.0211	55.1
8.0	23.0	29.5	26.2	0.0128	30.5	11.3	0.0152	50.3
16.0	23.0	27.5	24.2	0.0128	28.5	11.6	0.0109	46.4
30.0	23.0	25.0	21.7	0.0128	26.0	12.0	0.0081	41.6
60.0	23.0	22.5	19.2	0.0128	23.5	12.4	0.0058	36.8
125.0	23.0	20.0	16.7	0.0128	21.0	12.9	0.0041	32.0
330.0	23.0	17.5	14.2	0.0128	18.5	13.3	0.0026	27.2
1410.0	23.0	14.5	11.2	0.0128	15.5	13.8	0.0013	21.5
2850.0	23.0	13.5	10.2	0.0128	14.5	13.9	0.0009	19.5

Fractional Components

Gravel/Sand based on #4 sieve

Sand/Fines based on #200 sieve

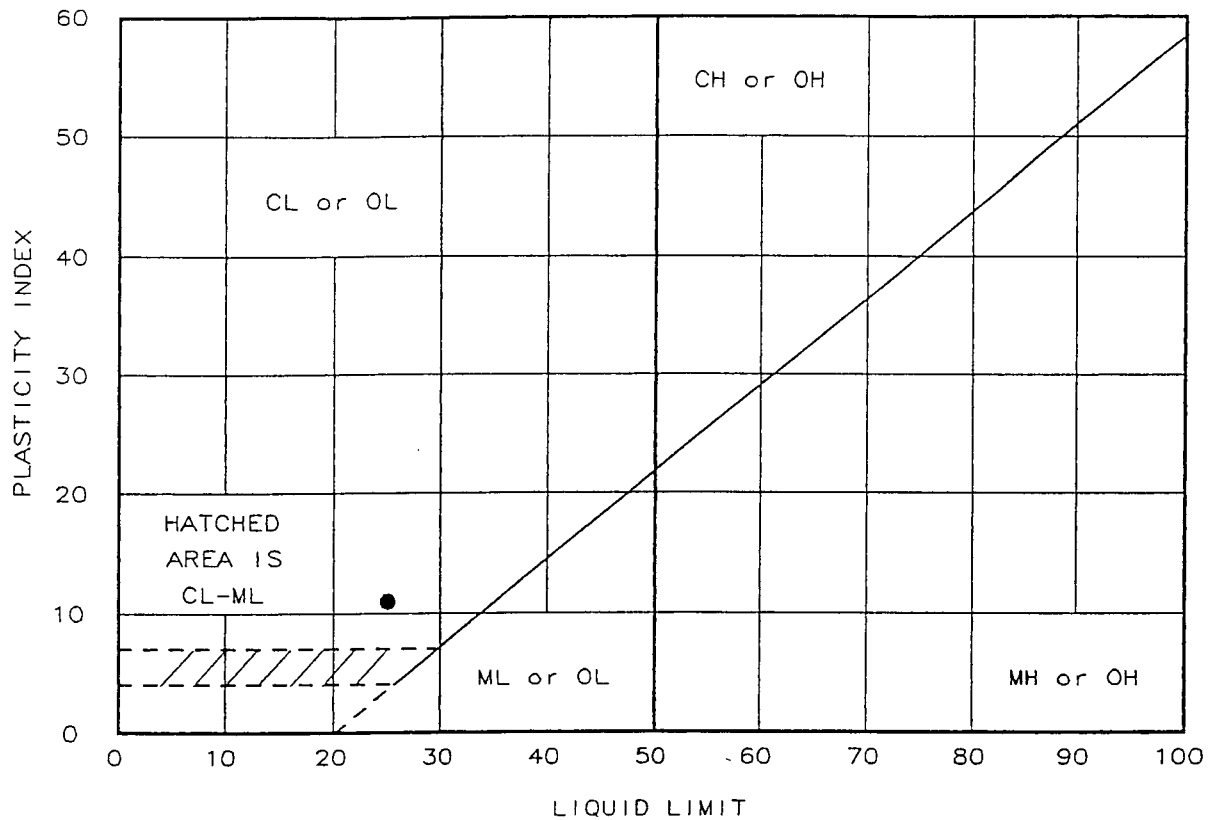
% + 3 in. = 0.0 % GRAVEL = 0.0 % SAND = 36.6

% SILT = 38.4 % CLAY = 25.0 (% CLAY COLLOIDS = 20.1)

D85= 0.35 D60= 0.034 D50= 0.015

D30= 0.0034

LIQUID AND PLASTIC LIMITS TEST REPORT



Location + Description	LL	PL	PI	-200	USCS	AASHTO
• BRN & GRAY SILTY CLAY, SOME SAND, TR FINE GRAVEL	25	14	11	65.1	CL	A-6(4)

Project No.: 97094.02
 Project: FEDDELER LANDFILL

 Client: R & M DISPOSAL
 Location: LOWELL, INDIANA

 Date: 2-23-98

LIQUID AND PLASTIC LIMITS TEST REPORT
WEAVER BOOS CONSULTANTS, INC.

Remarks:
 S-3

Fig. No. _____

LIQUID & PLASTIC LIMIT TEST DATA

PROJECT DATA

Project No.: 97094.02 Date: 2-23-98
 Client: R & M DISPOSAL
 Project: FEDDELER LANDFILL
 Project location: LOWELL, INDIANA
 Remarks: S-3

Figure no.:

TEST DATA - Test number 1

Location and description: BRN & GRAY SILTY CLAY,
 SOME SAND, TR FINE GRAVEL

LIQUID LIMITS

Run No.	1	2	3	4	35
WT w+t	36.7	37.8	33.0		W 33
WT d+t	32.1	33.6	30.0		A 33
WT tare	15.9	16.1	14.7		T 31
# Blows	17	27	47		E 29
Moisture	28.4	24.0	19.6		R 29

PLASTIC LIMITS

Run No.	1	2	3
WT w+t	40.9	40.3	
WT d+t	37.6	37.3	
WT tare	15.1	15.9	
Moisture	14.7	14.0	

Liquid Limit = 25

Plastic Limit = 14

Plasticity Index = 11

5 10 20 25 30 40
 NUMBER OF BLOWS

CLASSIFICATION DATA

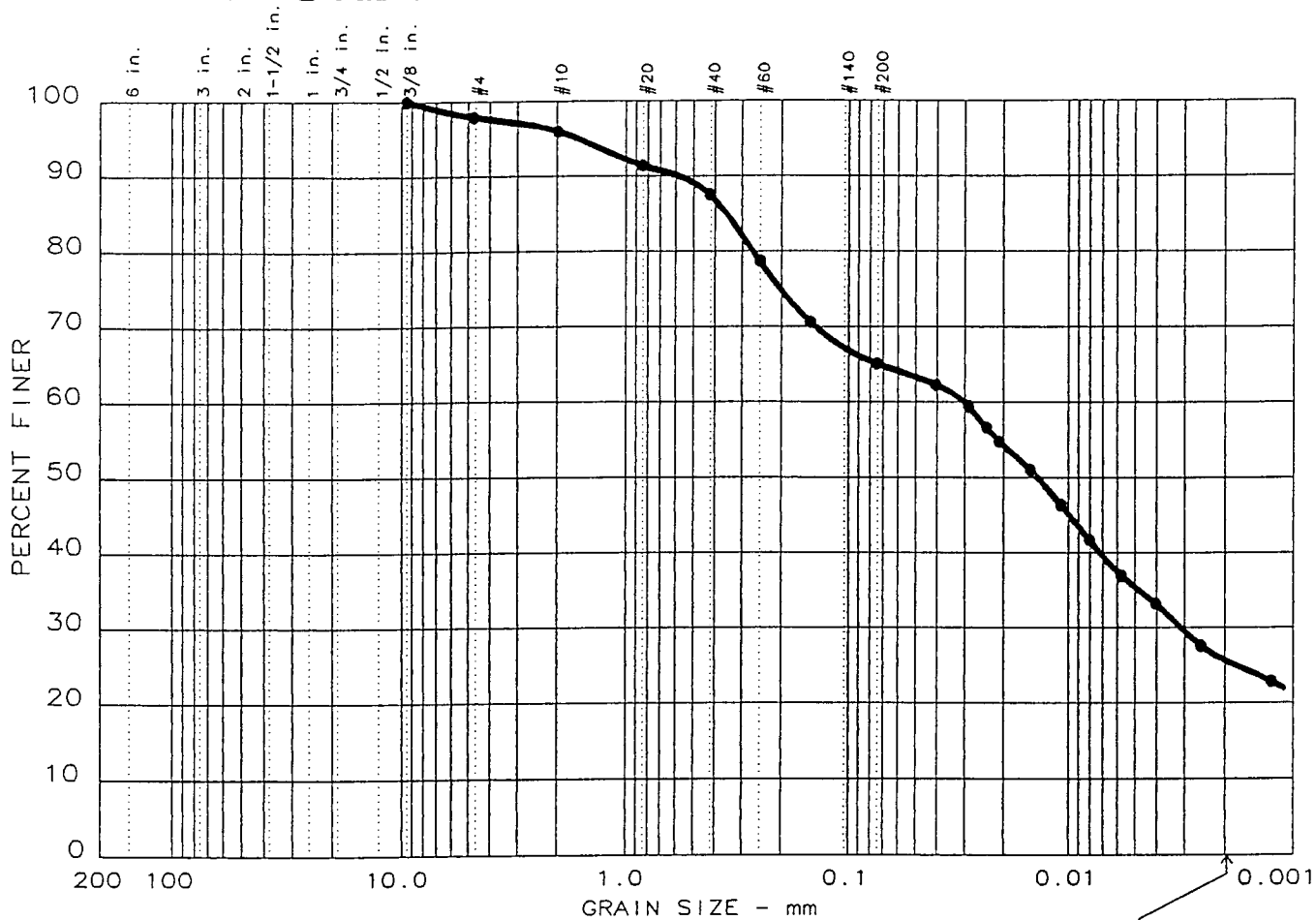
%-4 = 97.9 %-10 = 96.0 %-40 = 87.6 %-200 = 65.1
 Uniformity Coefficient = Curvature Coefficient =
 LL = 25 PL = 14 PI = 11 LL (oven dry) =

ASTM = CL, Sandy lean clay

AASHTO = A-6(4)

WEAVER BOOS CONSULTANTS, INC.

GRAIN SIZE DISTRIBUTION TEST REPORT



Test	% +3"	% GRAVEL	% SAND	% SILT	% CLAY
3	0.0	2.1	32.8	39.5	25.6

[illegible]

MATERIAL DESCRIPTION	USCS	AASHTO
• BRN & GRAY SILTY CLAY, SOME SAND, TR FINE GRAVEL	CL	A-6

Project No.: 97094.02
Project: FEDDELER LANDFILL
● Location: LOWELL, INDIANA

Date: 2-25-98

GRAIN SIZE DISTRIBUTION TEST REPORT
WEAVER BOOS CONSULTANTS, INC.

Remarks:

S-3

Figure No. _____

GRAIN SIZE DISTRIBUTION TEST DATA

Test No.: 3

Date: 2-25-98

Project No.: 97094.02

Project: FEDDELER LANDFILL

Sample Data

Location of Sample: LOWELL, INDIANA

Sample Description: BRN & GRAY SILTY CLAY, SOME SAND, TR FINE GRAVEL

USCS Class: CL

Liquid limit: 25

AASHTO Class: A-6

Plasticity index: 11

Notes

Remarks: S-3

Fig. No.:

Mechanical Analysis Data

Initial

Dry sample and tare= 368.70

Tare = 0.00

Dry sample weight = 368.70

Sample split on number 10 sieve

Split sample data:

Sample and tare = 50 Tare = 0 Sample weight = 50

Cumulative weight retained tare= 0

Tare for cumulative weight retained= 0

Sieve	Cumul. Wt. retained	Percent finer
-------	------------------------	------------------

0.375 inches	0.00	100.0
--------------	------	-------

# 4	7.70	97.9
-----	------	------

# 10	14.70	96.0
------	-------	------

# 20	2.40	91.4
------	------	------

# 40	4.40	87.6
------	------	------

# 60	9.00	78.7
------	------	------

# 100	13.20	70.7
-------	-------	------

# 200	16.10	65.1
-------	-------	------

Hydrometer Analysis Data

Separation sieve is number 10

Percent -# 10 based on complete sample= 96.0

Weight of hydrometer sample: 50

Calculated biased weight= 52.08

Automatic temperature correction

Composite correction at 20 deg C = -4

Meniscus correction only= 1

Specific gravity of solids= 2.75

Specific gravity correction factor= 0.978

Hydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	23.0	36.5	33.2	0.0128	37.5	10.1	0.0407	62.3
2.0	23.0	35.0	31.7	0.0128	36.0	10.4	0.0291	59.5
3.0	23.0	33.5	30.2	0.0128	34.5	10.6	0.0240	56.7
4.0	23.0	32.5	29.2	0.0128	33.5	10.8	0.0210	54.8
8.0	23.0	30.5	27.2	0.0128	31.5	11.1	0.0151	51.0
16.0	23.0	28.0	24.7	0.0128	29.0	11.5	0.0108	46.3
30.0	23.0	25.5	22.2	0.0128	26.5	11.9	0.0081	41.6
60.0	23.0	23.0	19.7	0.0128	24.0	12.4	0.0058	36.9
125.0	23.0	21.0	17.7	0.0128	22.0	12.7	0.0041	33.2
330.0	23.0	18.0	14.7	0.0128	19.0	13.2	0.0026	27.6
1410.0	23.0	15.5	12.2	0.0128	16.5	13.6	0.0013	22.9
2850.0	23.0	14.0	10.7	0.0128	15.0	13.8	0.0009	20.0

Fractional Components

Gravel/Sand based on #4 sieve

Sand/Fines based on #200 sieve

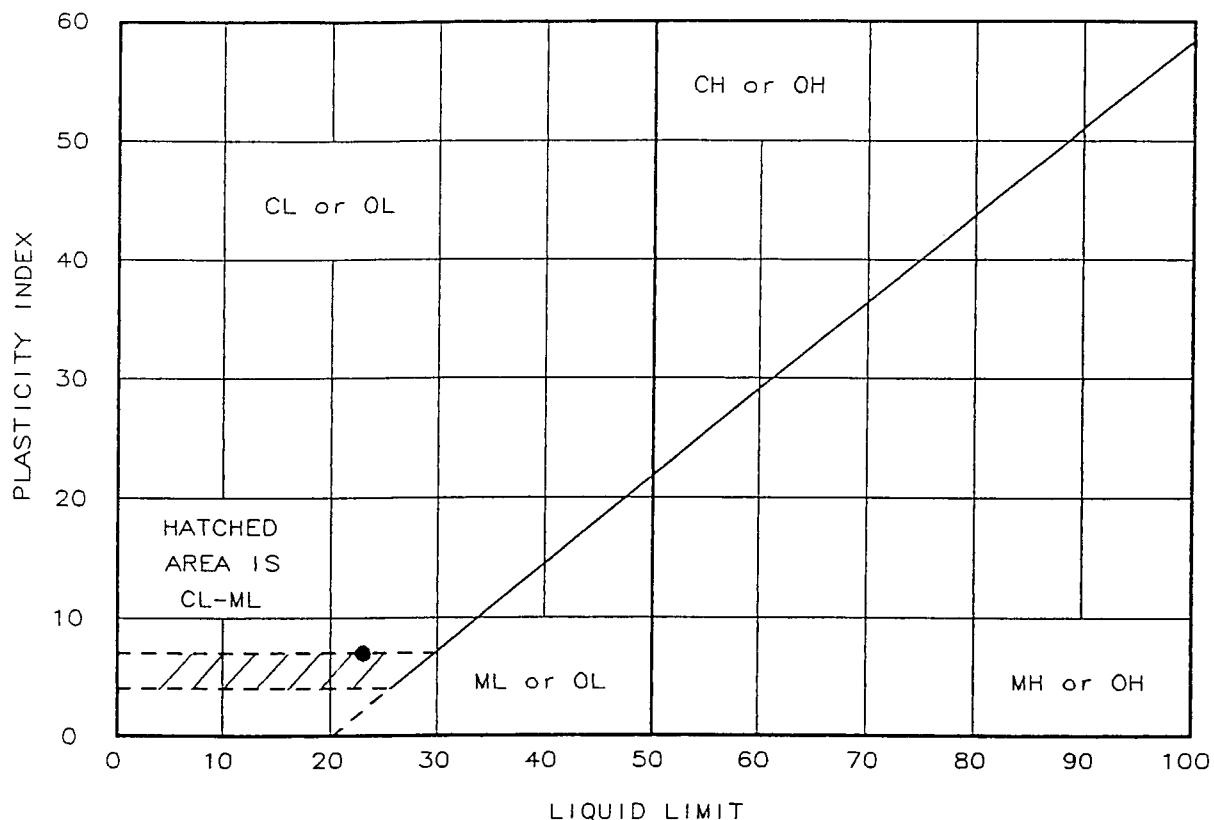
% + 3 in. = 0.0 % GRAVEL = 2.1 % SAND = 32.8

% SILT = 39.5 % CLAY = 25.6 (% CLAY COLLOIDS = 21.1)

D85= 0.35 D60= 0.030 D50= 0.014

D30= 0.0031

LIQUID AND PLASTIC LIMITS TEST REPORT



Location + Description	LL	PL	PI	-200	USCS	AASHTO
● GRAY TR BRN SILTY CLAY, SOME SAND, TR FINE GRAVEL	23	16	7	64.9	CL-ML	A-4(2)

Project No.: 97094.02
 Project: FEDDELER LANDFILL

 Client: R & M DISPOSAL
 Location: LOWELL, INDIANA

Date: 2-23-98

LIQUID AND PLASTIC LIMITS TEST REPORT
WEAVER BOOS CONSULTANTS, INC.

Remarks:

S-4

Fig. No. _____

LIQUID & PLASTIC LIMIT TEST DATA

PROJECT DATA

Project No.: 97094.02 Date: 2-23-98
 Client: R & M DISPOSAL
 Project: FEDDELER LANDFILL
 Project location: LOWELL, INDIANA
 Remarks: S-4

Figure no.:

TEST DATA - Test number 1

Location and description: GRAY TR BRN SILTY CLAY,
 SOME SAND, TR FINE GRAVEL

LIQUID LIMITS

Run No.	1	2	3	4	35
WT w+t	36.7	37.5	40.1		W
WT d+t	32.1	33.3	36.1		A 33
WT tare	15.4	15.2	16.0		T
# Blows	8	26	48		E 31
Moisture	27.5	23.2	19.9		R 29

PLASTIC LIMITS

Run No.	1	2	3	25
WT w+t	41.4	39.2		N 23
WT d+t	37.7	35.8		E 23
WT tare	14.9	14.9		T 21
Moisture	16.2	16.3		19

Liquid Limit = 23

Plastic Limit = 16

Elasticity Index = 7

5 10 20 25 30 40
 NUMBER OF BLOWS

CLASSIFICATION DATA

%-4 = 99.0 %-10 = 96.1 %-40 = 82.0 %-200 = 64.9
 Uniformity Coefficient = Curvature Coefficient =

LL = 23 PL = 16 PI = 7 LL (oven dry) =

ASTM = CL-ML, Sandy silty clay

AASHTO = A-4(2)

WEAVER BOOS CONSULTANTS, INC.

The graph illustrates the grain size distribution of a soil sample. The vertical axis represents the percentage of soil finer than a given grain size, ranging from 0 to 100. The horizontal axis represents the grain size in millimeters on a logarithmic scale, ranging from 200 mm to 0.001 mm. The curve shows that approximately 95% of the soil is finer than 4.75 mm (No. 4 sieve), and about 19% is finer than 0.075 mm (No. 20 sieve).

Grain Size (mm)	Sieve / Note	Percent Finer (%)
200		100
100		100
4.75	No. 4	95
2.0	No. 10	90
0.85	No. 20	85
0.425	No. 40	80
0.25	No. 60	75
0.15	No. 100	68
0.075	No. 200	65
0.06		60
0.0425		58
0.03		55
0.025		52
0.02		50
0.015		45
0.0125		40
0.01		35
0.0075		30
0.006		25
0.00425		20
0.003		19

Figure No. _____

Date: 2-25-98

Project No.: 97094.02

Project: FEDDELER LANDFILL

Sample Data

Location of Sample: LOWELL, INDIANA

Sample Description: GRAY TR BRN SILTY CLAY, SOME SAND, TR FINE GRAVEL

USCS Class: CL-ML

Liquid limit: 23

AASHTO Class: A-4

Plasticity index: 7

Notes

Remarks: S-4

Fig. No.:

Mechanical Analysis Data

Initial

Dry sample and tare= 337.60

Tare = 0.00

Dry sample weight = 337.60

Sample split on number 10 sieve

Split sample data:

Sample and tare = 50 Tare = 0 Sample weight = 50

Cumulative weight retained tare= 0

Tare for cumulative weight retained= 0

Sieve	Cumul. Wt. retained	Percent finer
0.375 inches	0.00	100.0
# 4	3.30	99.0
# 10	13.30	96.1
# 20	4.70	87.0
# 40	7.30	82.0
# 60	10.60	75.7
# 100	13.80	69.5
# 200	16.20	64.9

Hydrometer Analysis Data

Separation sieve is number 10

Percent -# 10 based on complete sample= 96.1

Weight of hydrometer sample: 50

Calculated biased weight= 52.05

Automatic temperature correction

Composite correction at 20 deg C = -4

Meniscus correction only= 1

Specific gravity of solids= 2.75

Specific gravity correction factor= 0.978

Hydrometer type: 152H Effective depth L= 16.294964 - 0.164 x Rm

Elapsed time, min	Temp, deg C	Actual reading	Corrected reading	K	Rm	Eff. depth	Diameter mm	Percent finer
1.0	23.0	36.0	32.7	0.0128	37.0	10.2	0.0408	61.4
2.0	23.0	35.0	31.7	0.0128	36.0	10.4	0.0291	59.5
3.0	23.0	34.0	30.7	0.0128	35.0	10.6	0.0240	57.6
4.0	23.0	32.5	29.2	0.0128	33.5	10.8	0.0210	54.8
8.0	23.0	31.0	27.7	0.0128	32.0	11.0	0.0150	52.0
16.0	23.0	28.0	24.7	0.0128	29.0	11.5	0.0108	46.4
30.0	23.0	25.5	22.2	0.0128	26.5	11.9	0.0081	41.7
60.0	23.0	22.5	19.2	0.0128	23.5	12.4	0.0058	36.0
125.0	23.0	20.0	16.7	0.0128	21.0	12.9	0.0041	31.3
330.0	23.0	17.5	14.2	0.0128	18.5	13.3	0.0026	26.6
1410.0	23.0	14.5	11.2	0.0128	15.5	13.8	0.0013	21.0
2850.0	23.0	12.5	9.2	0.0128	13.5	14.1	0.0009	17.2

Fractional Components

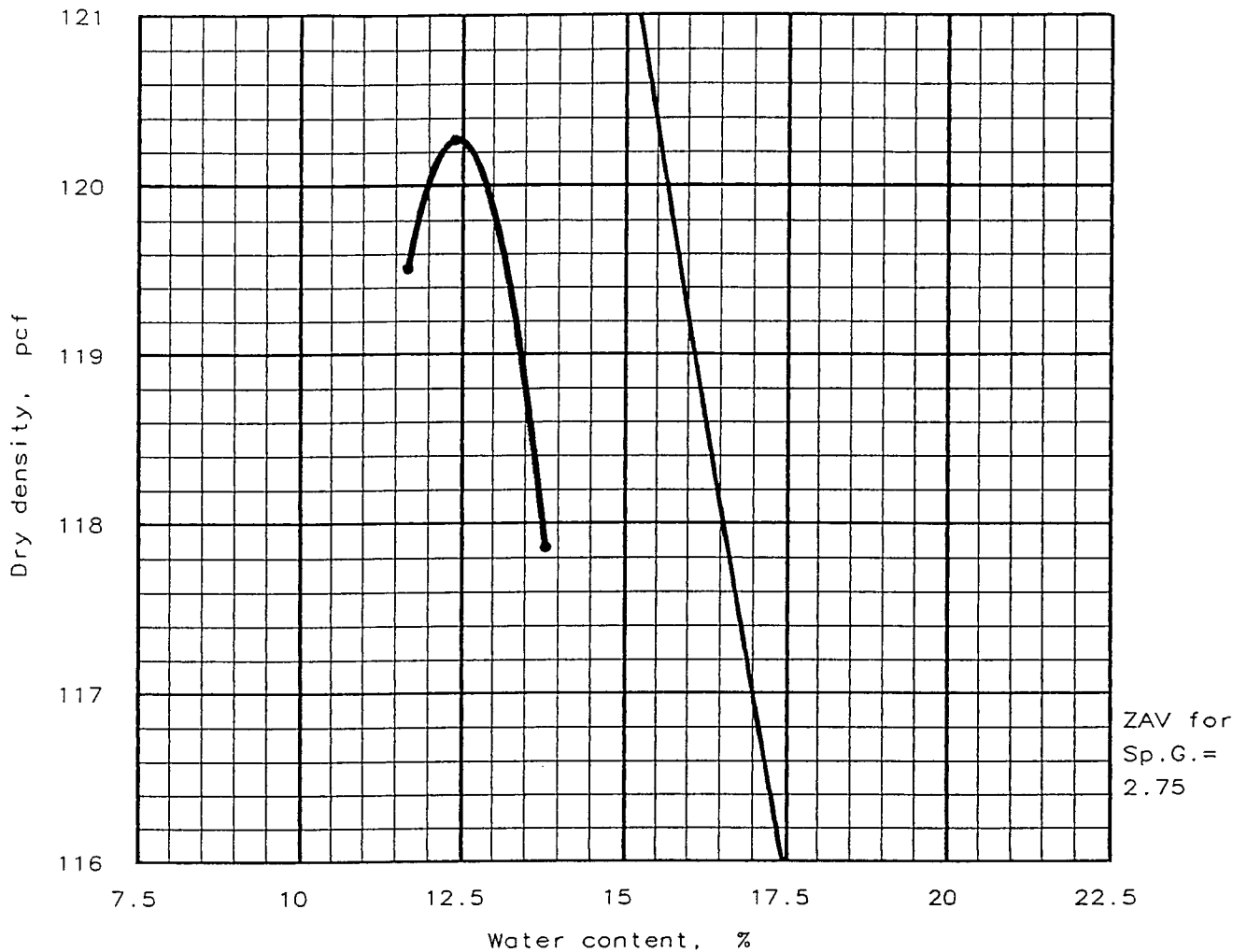
Gravel/Sand based on #4 sieve

Sand/Fines based on #200 sieve

% + 3 in. = 0.0 % GRAVEL = 1.0 % SAND = 34.1
% SILT = 40.2 % CLAY = 24.7 (% CLAY COLLOIDS = 18.5)

D85= 0.64 D60= 0.032 D50= 0.013
D30= 0.0036

MOISTURE-DENSITY RELATIONSHIP TEST



Test specification: ASTM D 698-91 Procedure A, Standard

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No. 4	% < No. 200
	USCS	AASHTO						
	CL-ML	A-4		2.75	23	7	1.0 %	64.9 %

TEST RESULTS				MATERIAL DESCRIPTION			
Maximum dry density = 120.3 pcf Optimum moisture = 12.4 %				GRAY TR BRN SITLY CLAY, SOME SAND, TR FINE GRAVEL			
Project No.: 97094.02 Project: FEDDELER LANDFILL Location: LOWELL, INDIANA Date: 2-20-98				Remarks: S-4			
MOISTURE-DENSITY RELATIONSHIP TEST WEAVER BOOS CONSULTANTS, INC.				Fig. No. _____			

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DATA FILE: 2

PROJECT DATA

Date: 2-20-98
Project no.: 97094.02
Project: FEDDELER LANDFILL
Location 1: LOWELL, INDIANA
2:
Remarks 1: S-4
2:
3:
Material 1: GRAY TR BRN SITLY CLAY,
description 2: SOME SAND, TR FINE GRAVEL
Elevation or depth:
Fig no:

SPECIMEN DATA

USCS classification: CL-ML AASHTO classification: A-4
Natural moisture: Specific gravity: 2.75
Percent retained on No.4 sieve: 1.0
Percent passing No. 200 sieve: 64.9
Liquid limit: 23 Plastic limit: 16 Plasticity index: 7

TEST DATA AND RESULTS

Type of test: Standard, ASTM D 698-91 Procedure A

Max dry den= 120.3 pcf
Opt moisture= 12.4 %

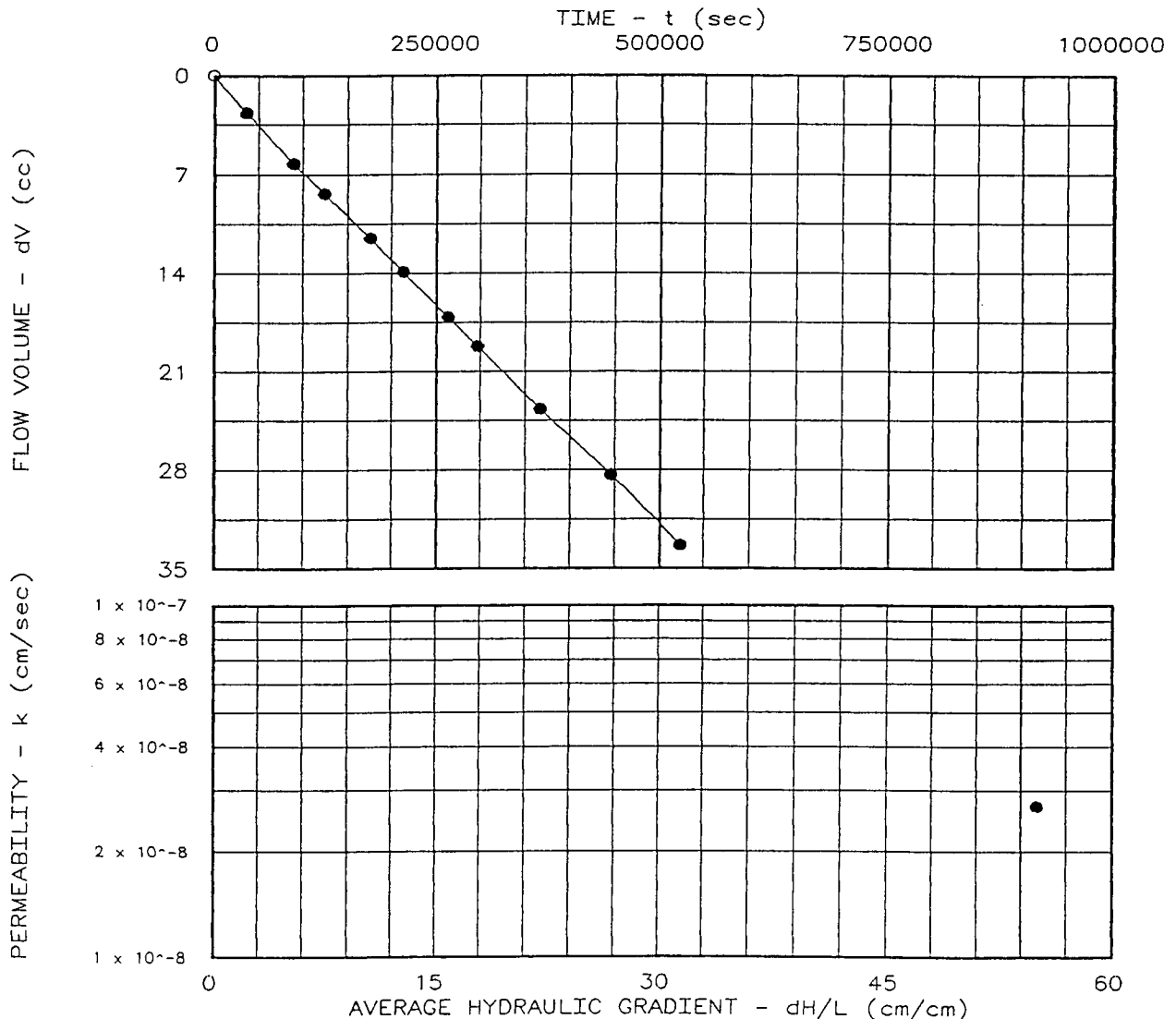
PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 7.14
 Specimen Diameter (cm): 7.16
 Dry Unit Weight (pcf): 121.3
 Moisture Before Test (%): 13.4
 Moisture After Test (%): 14.5
 Run Number: 1 ● 2 ▲
 Cell Pressure (psi): 30.0
 Test Pressure (psi): 25.0
 Back Pressure (psi): 19.4
 Diff. Head (psi): 5.6
 Flow Rate (cc/sec): 6.28×10^{-5}
 Perm. (cm/sec): 2.70×10^{-8}

SAMPLE DATA:

Sample Identification: SAMPLE: ST-2
 DEPTH: 0'-3'
 Visual Description: GRAY, TR BRN SILTY CLAY
 Remarks:
 Maximum Dry Density (pcf):
 Optimum Moisture Content (%):
 Percent Compaction:
 Permeameter type: FLEXIBLE WALL
 Sample type: SHELBY TUBE



Project: CLAY LINER CONSTRUCTION
 Location: LOWELL, INDIANA
 Date: 4-20-98

Project No.: 97094.02
 File No.: 97094.02
 Lab No.: 4
 Tested by: WSG
 Checked by: JWM
 Test: CH - Constant head

PERMEABILITY TEST REPORT

WEAVER BOOS CONSULTANTS, INC.

PERMEABILITY TEST DATA

PROJECT DATA

Project Name: CLAY LINER CONSTRUCTION
 File No.: 97094.02
 Project Location: LOWELL, INDIANA
 Project No.: 97094.02
 Sample Identification: SAMPLE: ST-2
 DEPTH: 0'-3'
 Lab No.: 4
 Description: GRAY, TR BRN SILTY
 CLAY
 Sample Type: SHELBY TUBE
 Max. Dry Dens.:
 Method (D1557/D698):
 Opt. Water Content:
 Date: 4-20-98
 Remarks:

Permeameter Type: FLEXIBLE WALL
 Tested by: WSG
 Checked by: JWM
 Test type: CH - Constant head

PERMEABILITY TEST SPECIMEN DATA

	Before test:			After test:		
Diameter:	1	2		1	2	
Top:	in	in		in	in	
Middle:	2.818 in	in		2.837 in	in	
Bottom:	in	in		in	in	
Average:	2.82 in	7.16 cm		2.84 in	7.21 cm	
Length:	1	2	3	1	2	3
	2.811 in	in	in	2.779 in	in	in
Average:	2.81 in	7.14 cm		2.78 in	7.06 cm	
Moisture, Density and Sample Parameters:						
Specific Gravity:	2.75					
Wet Wt. & Tare:	632.70			639.00		
Dry Wt. & Tare:	558.10			558.10		
Tare Wt.:	0.00			0.00		
Moisture Content:	13.4 %			14.5 %		
Dry Unit Weight:	121.3 pcf			121.0 pcf		
Porosity:	0.2936			0.2950		
Saturation:	88.4 %			95.3 %		

CONSTANT HEAD PERMEABILITY TEST CONDITIONS DATA

Cell No.: 4

Panel No.:

Positions:

Run Number:

1

2

Cell Pressure: 30.0 psi

0.0 psi

Saturation Pressure: 30.0 psi

0.0 psi

Inflow Corr. Factor: 1.00

1.00

Outflow Corr. Factor: 1.00

1.00

Test Temperature: 22.0 °C

0.0 °C

PERMRABILITY TEST READINGS DATA

CASE	DATE	TIME	ELAPSED	GAUGE		BURET		FLOW
D X		(24 hr)	TIME-sec	PRESSURE-psi		READING-cc		VOLUME-cc
S R				IN	OUT	IN	OUT	AVERAGE
S X	4/21/98	6:45:00	0	25.0	20.0	5.00	74.40	0.00
	4/21/98	16:57:00	36,720	25.0	20.0	7.60	71.70	2.65
	4/22/98	7:30:00	89,100	25.0	20.0	11.00	68.00	6.20
	4/22/98	17:03:00	123,480	25.0	20.0	13.10	65.80	8.35
	4/23/98	7:30:00	175,500	25.0	20.0	16.20	62.60	11.50
	4/23/98	17:53:00	212,880	25.0	20.0	18.40	60.00	13.90
	4/24/98	7:57:00	263,520	25.0	20.0	21.60	56.80	17.10
	4/24/98	17:03:00	296,280	25.0	20.0	23.60	54.60	19.20
	4/25/98	12:31:00	366,360	25.0	20.0	28.00	50.00	23.70
	4/26/98	10:32:00	445,620	25.0	20.0	32.80	45.50	28.35
	4/27/98	8:15:00	523,800	25.0	20.0	37.30	40.00	33.35

Test Pressure = 25.0 psi Differential Head = 5.6 psi, 393.1 cm H2O

Gradient = 5.505E 01 Flow rate = 6.277E-05 cc/sec R squared = 0.99988

Permeability, K22.0° = 2.834E-08 cm/sec, K20° = 2.701E-08 cm/sec

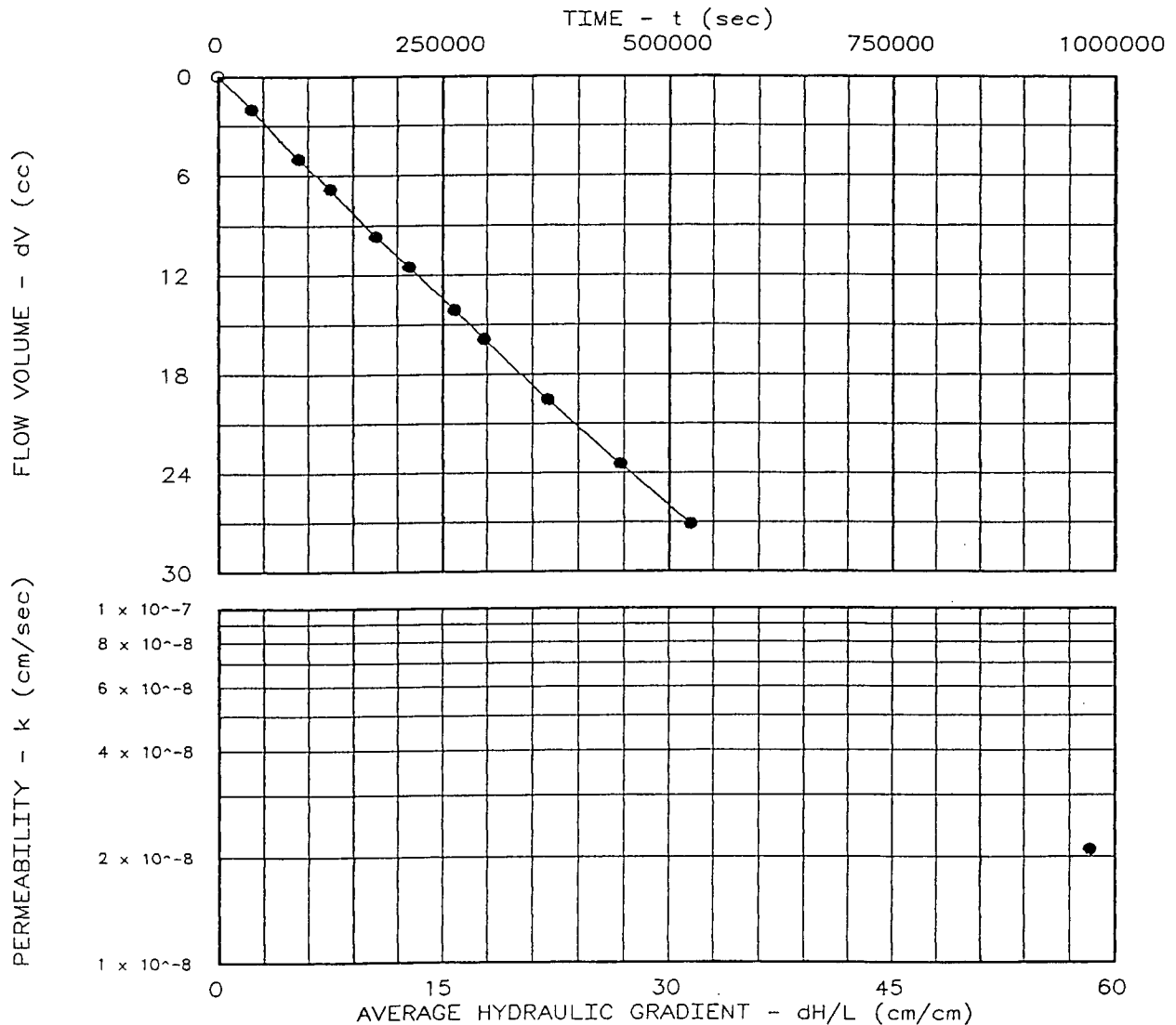
PERMEABILITY TEST REPORT

TEST DATA:

Specimen Height (cm): 6.95
Specimen Diameter (cm): 7.14
Dry Unit Weight (pcf): 120.7
Moisture Before Test (%): 13.8
Moisture After Test (%): 15.1
Run Number: 1 ● 2 ▲
Cell Pressure (psi): 30.0
Test Pressure (psi): 25.0
Back Pressure (psi): 19.2
Diff. Head (psi): 5.8
Flow Rate (cc/sec): 5.16×10^{-5}
Perm. (cm/sec): 2.10×10^{-8}

SAMPLE DATA:

Sample Identification: SAMPLE: ST-1
DEPTH: 0'-3'
Visual Description: GRAY, TR BRN SILTY CLAY
Remarks:
Maximum Dry Density (pcf):
Optimum Moisture Content (%):
Percent Compaction:
Permeameter type: FLEXIBLE WALL
Sample type: SHELBY TUBE



Project: CLAY LINER CONSTRUCTION
Location: LOWELL, INDIANA
Date: 4-20-98

Project No.: 97094.02
File No.: 97094.02
Lab No.: 3
Tested by: WSG
Checked by: JWM
Test: CH - Constant head

PERMEABILITY TEST REPORT

WEAVER BOOS CONSULTANTS, INC.



PERMEABILITY TEST DATA

PROJECT DATA

Project Name: CLAY LINER CONSTRUCTION
 File No.: 97094.02
 Project Location: LOWELL, INDIANA
 Project No.: 97094.02
 Sample Identification: SAMPLE: ST-1
 DEPTH: 0'-3'
 Lab No.: 3
 Description: GRAY, TR BRN SILTY
 CLAY
 Sample Type: SHELBY TUBE
 Max. Dry Dens.:
 Method (D1557/D698):
 Opt. Water Content:
 Date: 4-20-98
 Remarks:

Permeameter Type: FLEXIBLE WALL
 Tested by: WSG
 Checked by: JWM
 Test type: CH - Constant head

PERMEABILITY TEST SPECIMEN DATA

Before test:

After test:

Diameter:	1	2		1	2	
Top:	in	in		in	in	
Middle:	2.812 in	in		2.829 in	in	
Bottom:	in	in		in	in	
Average:	2.81 in	7.14 cm		2.83 in	7.19 cm	
Length:	1	2	3	1	2	3
	2.737 in	in	in	2.717 in	in	in
Average:	2.74 in	6.95 cm		2.72 in	6.90 cm	

Moisture, Density and Sample Parameters:

Specific Gravity:	2.75	
Wet Wt. & Tare:	612.70	619.90
Dry Wt. & Tare:	538.60	538.60
Tare Wt.:	0.00	0.00
Moisture Content:	13.8 %	15.1 %
Dry Unit Weight:	120.7 pcf	120.1 pcf
Porosity:	0.2969	0.3002
Saturation:	89.6 %	96.8 %

CONSTANT HEAD PERMEABILITY TEST CONDITIONS DATA

Cell No.: 3

Panel No.:

Positions:

Run Number:

1

2

Cell Pressure: 30.0 psi

0.0 psi

Saturation Pressure: 30.0 psi

0.0 psi

Inflow Corr. Factor: 1.00

1.00

Outflow Corr. Factor: 1.00

1.00

Test Temperature: 22.0 °C

0.0 °C

PERMEABILITY TEST READINGS DATA

CASE	DATE	TIME	ELAPSED	GAUGE	BURET	FLOW
D X		(24 hr)	TIME-sec	PRESSURE-psi	READING-cc	VOLUME-cc
S R				IN OUT	IN OUT	AVERAGE
S X	4/21/98	6:45:00	0	25.0 20.0	5.60 80.00	0.00
	4/21/98	16:57:00	36,720	25.0 20.0	7.80 78.20	2.00
	4/22/98	7:30:00	89,100	25.0 20.0	11.00 75.41	5.00
	4/22/98	17:03:00	123,480	25.0 20.0	12.80 73.60	6.80
	4/23/98	7:30:00	175,500	25.0 20.0	15.80 70.90	9.65
	4/23/98	17:53:00	212,880	25.0 20.0	17.50 68.90	11.50
	4/24/98	7:57:00	263,520	25.0 20.0	20.20 66.40	14.10
	4/24/98	17:03:00	296,280	25.0 20.0	21.90 64.60	15.85
	4/25/98	12:31:00	366,360	25.0 20.0	25.70 61.00	19.55
	4/26/98	10:32:00	445,620	25.0 20.0	29.70 57.20	23.45
	4/27/98	8:15:00	523,800	25.0 20.0	33.40 53.60	27.10

Test Pressure = 25.0 psi Differential Head = 5.8 psi, 405.4 cm H2O

Gradient = 5.831E 01 Flow rate = 5.159E-05 cc/sec R squared = 0.99943

Permeability, K22.0° = 2.208E-08 cm/sec, K20° = 2.105E-08 cm/sec